

IT IS CLAIMED:

Sub. a2> 1. A stent designed for catheter delivery to a target neurovascular site via a tortuous path in a contracted state, and deployment at the target site in an

5 expanded state, comprising

a plurality of expandable tubular members, each member being composed of a continuous wire element forming a plurality of wave segments, each segment containing a pair of opposite looped peaks and having a wave shape such that the distance between adjacent sides of a wave in the stent's

10 expanded state, on proceeding from a peak toward opposite peaks, increases monotonically with an inflection point therebetween, and

axial connectors joining adjacent tubular members,

wherein radial expansion of the stent from its contracted to expanded state is accommodated by movement of adjacent wave-segment peaks away

15 from one another, without significant change in the axial dimension of the stent.

2. The stent of claim 1, wherein the wire elements are formed of a NiTi shape memory alloy, and said radial expansion is achieved by releasing the stent from such catheter.

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3. The stent of claim 2, which has a stress-induced martensite phase at body temperature.

Sub 36> 4. The stent of claim 2, which has an austenite phase transition

25 temperature below body temperature.

5. The stent of claim 1, wherein the connectors connecting adjacent tubular members are attached to confronting peaks of the adjacent members, and the connectors are spaced from one another by intervening, unconnected confronting peaks.

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6. The stent of claim 5, which can be carried in a distal end region of a catheter having a lumen inner diameter between about 0.5 and 2 mm, and adapted to be placed at the target site via a tortuous vascular path in the brain.

5 7. The stent of claim 1, wherein the stent in its contracted state has an inner diameter of between 0.5 and 2 mm, and the stent diameter in its expanded state is between 2-9 times that in its contracted state.

10 8. A system for treating a aneurysm or other vascular abnormality in a neurovascular target vessel having an inner diameter less than about 8 mm and accessible via a tortuous vascular path, comprising

a guide wire that can be deployed at the target site,

a catheter having a lumen inner diameter of 0.5 to 2 mm and a distal end region in the lumen, and adapted to be placed at the target site via such path,

15 the stent of claim 1 adapted to be carried in its contracted state within the catheter's distal end region, where the catheter and stent carried therein are adapted to be moved axially along the guide wire, for placing the catheter at the target site, and

20 a pusher wire movable through the catheter, for forcing the stent out of the catheter into the vascular site, where stent radial expansion to its expanded state is effective to lodge the stent at the target site.

25 9. The system of claim 8, wherein the stent wire elements are formed of a NiTi shape memory alloy, and said radial expansion is achieved by releasing the stent from such catheter.

10. The system of claim 9, wherein the stent is held in its contracted state in a stress-induced martensite state.

30 11. The system of claim 8, which further includes a stabilizer attached to the distal end of the pusher wire, engageable with the stent when forcing the same from the catheter.

12. The system of claim 8, wherein the stent in its contracted state has an inner diameter of between 0.5 and 2 mm, and a diameter in the expanded state of between 2-9 times that in the contracted state.

Sub. 5 23 > 13. A method of treating an aneurysm or other vascular abnormality in a neurovascular target vessel having an inner diameter less than about 8 mm and accessible via a tortuous vascular path, comprising  
 navigating a guide wire to the target site,  
 moving over the guide wire, a catheter having a lumen inner diameter of 0.5 to 2 mm and a distal end region in the lumen, and the stent of claim 1 carried in its contracted state within the catheter's distal end region, until the catheter distal end is located at the target site,  
 replacing the guide wire with a pusher wire, and  
 using the pusher wire to force the stent out of the catheter into the vascular site, where stent radial expansion to its expanded state is effective to lodge the stent at the target site.

14. The method of claim 13, wherein the stent wire elements are formed of a NiTi shape memory alloy, and said radial expansion is achieved by releasing the stent from such catheter.

15. The method of claim 14, wherein the stent is held in its contracted state in a stress-induced martensite state.

16. The method of claim 13, wherein the pusher wire is equipped at its distal end with a stabilizer that is engageable with the stent when forcing the same from the catheter.

17. The method of claim 13, wherein the stent in its contracted state has an inner diameter of between 0.5 and 2 mm, and a diameter in the expanded state of between 2-9 times that in the contracted state.